

AMENDMENTS TO THE CLAIMS

1. (Currently Amended) An apparatus comprising:
a combination digital signal and radio frequency connector for directly coupling a motherboard to a radio frequency module board;
a spring cage and a barrel; and
a spring cage and barrel connection surrounding a ground line, wherein a ground connection from the spring cage and a ground connection from the barrel are each coupled to a surface co-planar waveguide ground on their respective motherboard and radio frequency board.
2. (Original): The apparatus of Claim 1, further comprising a pin and receptacle connection for a signal line in the radio frequency connector.
3. (Original): The apparatus of Claim 2, wherein the receptacle comprises a sheet of metal stamped and rolled into a tulip shape.
4. (Canceled)
5. (Currently Amended) The apparatus of Claim 4, 1 wherein the spring cage and barrel comprise a sheet metal stamped and rolled into a substantially cylindrical form.
6. (Currently Amended) The apparatus of Claim 4, 1 wherein the spring cage comprises finger springs having flexural compliance that retains a close contact against an inner surface of the barrel upon mating.
7. (Currently Amended) An apparatus comprising:
a radio frequency board having a combination digital signal and radio frequency connector adapted for directly coupling to a motherboard for a computer;
a spring cage and a barrel; and

a spring cage and barrel connection surrounding a ground line, wherein a ground connection from the spring cage and a ground connection from the barrel are each coupled to a surface co-planar waveguide ground on their respective radio frequency board and motherboard for a computer.

8. (Original): The apparatus of Claim 7, further comprising a pin and receptacle connection for a signal line in the radio frequency connector.

9. (Original): The apparatus of Claim 8, wherein the receptacle comprises a sheet of metal stamped and rolled into a tulip shape.

10. (Canceled)

11. (Currently Amended): The apparatus of Claim ~~10~~ 7, wherein the spring cage and barrel comprise a sheet of metal stamped and rolled into a substantially cylindrical form.

12. (Currently Amended): The apparatus of Claim ~~10~~ 7, wherein the spring cage comprises finger springs having flexural compliance that retains a close contact against an inner surface of the barrel upon mating.

13. (Currently Amended) An apparatus comprising:

a pin and receptacle connection for transferring a signal coupled between a radio frequency module compatible with a first mobile computer motherboard and a second motherboard in a mobile computer;

a spring cage and a barrel; and

a spring cage and barrel connection coupled around the pin and receptacle connection for transferring a ground, ~~wherein the apparatus comprises; and~~

a radio frequency coaxial direct board to board connection, wherein a ground connection from the spring cage and a ground connection from the barrel are each coupled to a surface co-planar waveguide ground on the respective first and second mobile computer motherboards.

14. (Original) The apparatus of Claim 13, wherein the receptacle comprises a sheet metal stamped and rolled into a tulip shape.

15. (Original) The apparatus of Claim 13, wherein the receptacle and the spring cage are made from at least one of phosphor bronze, beryllium copper and brass.

16. (Original) The apparatus of Claim 13, wherein the pin and barrel comprise a copper alloy.

17. (Original) The apparatus of Claim 16, wherein copper alloy is plated to avoid corroding.

18. (Original) The apparatus of Claim 13, wherein the spring cage and barrel comprise a sheet metal stamped and rolled into a substantially cylindrical form.

19. (Original) The apparatus of Claim 13, wherein the spring cage comprises finger springs having flexural compliance that retains a close contact against an inner surface of the barrel upon mating.

20. (Canceled).

21. (Currently Amended) The apparatus of Claim ~~20~~ 13, wherein the co-planar waveguide grounds are coupled to their respective printed circuit board ground planes by vias in the boards.

22. (Canceled)

23. (Canceled).

24. (Currently Amended) An apparatus comprising:

a direct board to board coaxial connection having a male portion and a female portion,
wherein one of the male portion and female portion is coupled to a computer motherboard having a
ground plane and the other of the male portion and female portion is coupled to a radio frequency
module card having a ground plane, such that the radio frequency module card is removeably
coupled to the computer motherboard by the direct board to board coaxial connection, wherein the
direct board to board coaxial connection comprises a pin and receptacle connection for transferring
a signal and a spring cage and barrel connection for transferring a ground signal; and

a spring cage and a barrel, wherein the spring cage and barrel transfer a the ground signal to
a surface co-planar waveguide ground and then to the ground plane of the motherboard and the
ground plane of the radio frequency module card through vias.

25. (Currently Amended) A method comprising:

forming a signal pin;
stamping a ground shield spring cage from a sheet of metal;
rolling the ground shield spring cage to form a cage with finger springs for gripping the
inside of a ground barrel;
stamping a ground barrel from a sheet of metal;
rolling the ground barrel into a cylinder;
stamping a signal pin receptacle from a sheet of metal;
rolling the signal pin receptacle to form a cylinder with a spring end that resembles a tulip;
plating the pin and the barrel;

assembling the signal pin, ground spring cage, and a housing to form a male coaxial connector by press interference fitting, wherein a ground connection from the ground spring cage is coupled to a surface co-planar waveguide ground; and

assembling the signal pin receptacle, ground barrel and a housing to form a female coaxial connector by press interference fitting, wherein a ground connection from the ground barrel is coupled to a surface co-planar waveguide ground.

26. (Original) The method of Claim 25, further comprising:

fabricating the ground shield spring cage and signal pin receptacle from one of the group comprising phosphor bronze, beryllium copper, or brass.

27. (Original) The method of Claim 26, further comprising:

fabricating the signal pin and outer ground shield from a copper alloy.

28. (Currently Amended) A method comprising:

aligning a radio frequency module board compatible with a computer motherboard with a computer motherboard; and

connecting the radio frequency module board to the motherboard of a computer using direct board to board radio frequency coaxial connectors wherein the connectors comprise a signal pin, a signal pin receptacle, a ground shield spring cage and a ground shield barrel; and the signal pin receptacle, ground shield spring cage and ground shield barrel are fabricated from stamped sheets of metal; and

coupling a ground connection from the ground shield cage and ground shield barrel to a surface co-planar waveguide ground.

29. (Original) The method of Claim 28, further comprising:

coupling the signal pin to the signal pin receptacle to form a signal line connection between the radio frequency module board and the computer motherboard.

30. (Currently Amended) The method of Claim 28, further comprising:

coupling the ground shield spring cage to the ground shield barrel to form a ground shield connection for ~~the~~ a signal line connection between the radio frequency module board and the computer motherboard.